Categorical Exclusion

Seed Bank Analysis in Burned and Unburned Critical Habitat for Mojave Desert Tortoise
DOI-BLM-AZ-A030-2010-0003-CX

A. Background

BLM Office: Grand Canyon-Parashant National Monument (GCPNM) and Arizona Strip Field Office (ASFO) of the Bureau of Land Management (BLM)

Location of Proposed Action: Pakoon Basin, GCPNM and North Slope Virgin Mountains, ASFO

Lease/Serial/Case File No.: N/A

Once burned, invasive, alien annual grasses such as red brome, cheatgrass and Mediterranean grass become dominant in the Mojave Desert. The abundance of grasses supports a feedback system known as the grass/fire cycle that reduces the cover of native shrubs, bunchgrasses and annuals each time a new cycle occurs, which degrades the native plant communities and desert tortoise habitat. Mortalities of desert tortoises are often observed immediately after wildfires, but the indirect effects due to habitat loss, shifts in the dominant vegetation from native shrubland to invasive grasses, emigration of tortoises away from burned habitat, and lower growth and reproductive output may have a more profound and lasting effect on desert tortoise populations than the wildfires, themselves (Esque *et al.* 2003; Brooks and Esque 2002).

In 2002, United States Geologic Survey (USGS) conducted preliminary assays of the seed banks in large burned areas and compared them to adjacent unburned areas. Although the sample size was small and outside the long-term rehabilitation areas, initial results indicated few native plant species may be left in sites burned multiple times. In addition, climate, soil attributes and prevalence of seed predators likely interact to influence the abundance and diversity of the seed bank but have never been simultaneously investigated. The Bureau of Land Management (BLM) and USGS propose to assess the native plant seed bank in burned and unburned sites in the Pakoon Basin and North Slope of the Virgin Mountains to understand the status of native seed banks present. Little or no native seed left in the seed bank could show that passive rehabilitation methods will most likely be unsuccessful and aggressive rehabilitation is required (e. g, redevelopment of fertile islands, out-planting, seeding). An abundant native seed bank that also is dominated by non-native annuals could show that expensive seeding may not be necessary, but the suppression of non-natives is important (e.g., pre-emergent grass-specific herbicide and/or establishment of natives with high competitive potential). The advantage of sampling the seed bank as opposed to aboveground production is that we can identify a greater portion of the potential plant community that lies dormant in any given year. The BLM and USGS have a successful partnership in the Pakoon Basin to understand the short-term effects of how fire and granivores changed vegetation since 1998 (Esque *et al.,* 2010). The new work proposed here would build on the considerable investment provided by previous research in the Mojave Desert on the Arizona Strip.

A workshop hosted by the Desert Manager's Group in California highlighted their support of seed bank analyses because of the need to understand recovery from a variety of disturbance types. This research could provide guidelines for managers of other lands in the northwest Mojave Desert who are also dealing with rehabilitation of areas extensively burned in 2005 & 2006 (especially for the Mojave Desert Initiative working group which includes the Las Vegas and Ely BLM field offices, as well as the Arizona Strip District) and to other research projects designed to restore seed banks, by providing information about the natural range of variability in desert seed banks.

The Mojave Desert on the Arizona Strip has been subjected to multiple wildfires since the 1980s, early 1990s, and again in 2005 & 2006 that are especially pronounced following years of above-average winter precipitation. North American deserts are characterized by extreme temperatures and low precipitation; thus, they are slow to recover and there is the potential of entirely losing the native plant communities without successful rehabilitation of native vegetation. In an effort to accelerate the re-establishment of plants important as food and necessary as thermal cover for desert tortoises, the BLM has implemented rehabilitation treatments across a network of long-term monitoring sites in northwestern Arizona and southern Nevada. During the past four years of monitoring, USGS has recognized the importance of determining the status of soil seed banks prior to treatment implementation. Whereas some areas may have suitable seed banks for natural regeneration, most burned areas lack sufficient seed sources. Furthermore, areas that have re-burned numerous times are likely to experience the local extinction of some native species and the dominance of aggressive non-native species, but this dynamic has not been well documented for such burned areas or for various vegetation communities.

The project builds on previously collected information about the short-term effects of fire on desert seed banks. USGS researchers have already worked out the research design (Esque *et al.,* 2010), and are able to identify many of the plants that are expected to occur in the area (by identifying the first leaf or whorl of leaves developed by the embryo).

B. Description of Proposed Action:

Three paired research study areas have been located within creosote-bursage and within blackbrush shrubland vegetation types. These six study areas have burned and have suitable adjacent unburned habitat for controls (see Mojave Seed Bank Plot Sites map).

Within each paired burned/adjacent unburned location, seven replicated soil samples (each sample = 400 cm^2 and 2.5 cm depth, [0.43 ft^2 by 1inch]) would randomly be collected after seeds have dropped from plants, entered the soil seed bank and after-ripened (total number of samples = 3 areas x 2 veg x 2 treat x 7 reps = 84 samples). The samples would be collected around intact shrubs (unburned) or former shrub islands (burned). Samples would also be collected at these sites for soil particle size analysis (100 cm^2 and 2.5 cm depth, [0.16 ft^2 by 1 inch]). The abundance of active ant nests and rodent burrow entrances has been useful in predicting granivore pressure (DeFalco *et al.* 2009) and would be quantified in 20 m (65.6 ft) radius of each sampling point.

Seed bank samples would be transported to the Community College of Nevada greenhouse facility and grown out using methods modified from Young and Evans (1975) and Young *et al.* (1981). Samples would be subjected to four alternating wet-dry cycles known to promote germination of seeds (Mayer and Poljakoff-Mayber 1982, Baskin and Baskin 1998), including those of Mojave Desert species (Esque 2004, DeFalco *et al.* 2009, Scoles-Sciulla and DeFalco 2009). Emerging seedlings would be counted and harvested after identification using a seedling library developed for seed bank studies (USGS unpublished data).

Seed bank species richness would be compared in the burned and unburned areas and among the vegetation communities (creosote-bursage and blackbrush) using a Split Plot design and analyzed using Analysis of Covariance (ANCOVA). Covariates in the analysis would include rainfall (derived from NOAA-National Weather Service spatial data), soil particle size distribution, and granivore pressure. Multivariate analyses would also compare the seed bank plant community structure of the burned and unburned areas and among the vegetation communities.

C. Requirements of Implementation:

If California condors are encountered while the proposed activity is underway, project personnel must notify the BLM wildlife team lead at (435) 688-3200. Project activities would be modified or delayed if those activities have adverse effects on condors.

Project personnel would dispose of all waste, including micro-trash. Micro-trash includes small and easily ingestible materials such as bottle caps, pull tabs, broken glass, cigarette butts, small plastic bits, lead bullets, and bullet casings, even food materials.

A permitted monitor or biologist would be present during sampling to provide education and ensure no contact with tortoise occur, and that no vegetation would be disturbed. Only biologists authorized and permitted by the US Fish and Wildlife Service and Arizona Game and Fish Department would handle desert tortoises.

During the tortoise active season (March 15 – October 15) vehicles associated with the proposed action would not exceed 20 mph on unpaved roads within critical habitat for Mojave desert tortoise. Vehicles would be limited to designated routes within the Grand Canyon – Parashant National Monument and to existing roads in the Arizona Strip Field Office.

If a tortoise or clutch of tortoise eggs is found in the area to be sampled, activities would be modified to avoid injuring or harming it.

A desert tortoise education program would be presented to all project personnel that may encounter tortoises, prior to initiation of activities that may result in disturbance of desert tortoise habitat or death or injury of desert tortoises.

No hazing or harassment of wildlife would be permitted.

To comply with Section 106 of NHPA, a cultural inventory has been completed and no cultural resources were found.

D. Land Use Plan Conformance

Land Use Plan Names: Grand Canyon-Parashant National Monument, Records of Decision and Resource Management Plan/General Management Plan, Arizona Strip Field Office Record of Decision and Resource Management Plan

Date Approved/Amended: February 2008

The proposed action is in conformance with the applicable LUP because it is specifically provided for in the following Grand Canyon – Parashant RMP decision(s):

DFC-SR-01 Approved scientific research will contribute to management of natural and cultural resources and achieving Desired Future Conditions.

MA-SR-01 Permits will be required for approved scientific research to insure compatibility and reporting of results.

MA-SR-02 The collection of any objects in the Monument will not be authorized except by permit for scientific research.

The proposed action is in conformance with the applicable LUP because it is specifically provided for in the following Arizona Strip Field Office RMP decision(s):

DFC-SR-01 Approved scientific research will contribute to management of natural and cultural resources and achieving Desired Future Conditions.

MA-SR-01 Permits will be required for approved scientific research to insure compatibility and reporting of results.

E: Compliance with NEPA:

The Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 2, Appendix 3, 1.6 [43 CFR Section 46.210(e)] Nondestructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research, and monitoring activities.

This categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects that may significantly affect the environment. The proposed action has been reviewed, and none of the extraordinary circumstances described in 516 DM2 apply (See Attachment 1).

We considered the fact that the proposed project is located within Mojave Desert Tortoise Critical Habitat, and that the Mojave Desert Tortoise is an object in the Grand Canyon – Parashant National Monument. We also considered the fact that there would be no impact on Mojave Desert Tortoise or attributes of Critical Habitat because a permitted monitor or biologist would be present during sampling to provide education and ensure no contact with tortoise occur, and that no vegetation would be disturbed.

F: Signature

Authorizing Officials:

_____ Date: _____
(Signature)
Name: Tom Edgerton
Title: Monument Manager

_____ Date:_____
(Signature)
Name: Lorraine M. Christian
Title: Arizona Strip Field Office Manager

Contact Person

For additional information concerning this CX review, contact:

Kathleen Harcksen, Project Manager
Arizona Strip District
345 East Riverside Drive
St. George, UT 84790
(435) 688-3380

Attachment 1

EXTRAORDINARY CIRCUMSTANCES REVIEW AND CHECKLIST

IMPORTANT: Appropriate staff should review the circumstances listed below, and comment for concurrence. Rationale supporting the concurrence should be included where appropriate.

EXTRAORDINARY CIRCUMSTANCES Does the proposed action…	**YES/NO & RATIONALE (If Appropriate)**	**STAFF**
1. Have significant impacts on public health and safety?	No	Harcksen
2. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness or wilderness study areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds (Executive Order 13186); and other ecologically significant or critical areas?	No	Jensen, Val Alfen, Beal, Harcksen,
3. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2)(E)]?	No	Harcksen
4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	No	Harcksen
5. Establish a precedent for future action, or represent a decision in principle about future actions, with potentially significant environmental effects?	No	Harcksen
6. Have a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects?	No	Harcksen
7. Have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by either the Bureau or office?	No	Hawks
8. Have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?	No	Jensen Hughes
9. Violate a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment?	No	Harcksen Van Alfen
10. Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898)?	No	Harcksen
11. Limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners, or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007)?	No	Bensen, Van Alfen
12. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area, or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?	No	Harcksen Bunting